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RAYMOND R. MOSER JR., ESQ. MOSER IP LAW GROUP 1030 BROAD STREET 2ND FLOOR SHREWSBURY, NJ 07702			H.A. NATHAN W	
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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte DAVID LEE

Appeal 2008-5389
Application 10/730,758
Technology Center 2800

Decided: January 9, 2009

Before BRADLEY R. GARRIS, LINDA M. GAUDETTE, and
JEFFREY B. ROBERTSON, *Administrative Patent Judges*.

ROBERTSON, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellant appeals under 35 U.S.C. § 134(a) (2002) from the
Examiner's final rejection of pending claims 1-11.¹ (Examiner's Answer

¹ Claims 12-14 have been withdrawn from consideration. (Corrected Appeal Brief filed Oct. 12, 2006, hereinafter "Br.," 2).

entered Dec. 8, 2006, hereinafter “Ans”). We have jurisdiction pursuant to 35 U.S.C. § 6(b) (2002).

We REVERSE.

Appellant’s claimed invention is directed to a method of packaging at least one component. (Spec. [0018]-[0028], Fig. 7).

Claim 1 is representative of the claims on appeal, and recites:

1. A method of packaging at least one component, comprising:

providing a lid having a plurality of vent holes;

molding sidewalls onto a substrate to form a plurality of cavities surrounding a component-mounting surface;

mounting a component on the component-mounting surface in each cavity;

applying a curable adhesive to a top surface of the sidewalls;

placing the lid upon the top surface of the sidewalls such that at least one vent hole is aligned with each cavity;

curing said adhesive, said vent hole providing a path for outgassing during curing;

sealing said vent holes to form a component package assembly having a plurality of cavities, separated by sidewalls; and

separating the component package assembly into a plurality of individual component packages.

The prior art relied upon by the Examiner in rejecting the claims on appeal is:

Mahulikar	US 4,897,508	Jan. 30, 1990
Song	US 5,776,799	July 7, 1998
Miyawaki	US 6,268,236 B1	July 31, 2001

The Examiner rejected claims 1-7 and 9-11 under 35 U.S.C. § 103(a) as being unpatentable over Miyawaki in view of Mahulikar. The Examiner rejected claim 8 as being unpatentable over Miyawaki in view of Mahulikar and further in view of Song.

The Examiner finds that “in figs. 2A-2C, Miyawaki discloses...molding sidewalls 1B, for example, onto a substrate to form a plurality of cavities 4 surrounding a component-mounting surface.” (Ans. 3). The Examiner also contends that “Miyawaki indeed shows that to create the walls on the first substrate in order to from [sic, form] the cavities, the process can be carried out by either molding the walls or penetrating the holes in a substrate.” (Ans. 6-7). For support, the Examiner states that “Miyawaki acknowledges that the hollow, or cavity, can achieve the same sealing and separation characteristics as those attained by ‘transfer molding’ (an actual process), and can yield the same productivity....” (Ans. 6, citing Miyawaki, col. 1, lines 51-58). The Examiner further states, “[t]hus, it renders the obviousness of [sic] the step of creating cavities by molding process.” (Ans. 6). The Examiner argues that “molding” is a broad limitation and that Miyawaki teaches that molding is a conventional process in semiconductor packaging. (Ans. 7).²

Appellant contends that Miyawaki teaches bonding an upper substrate to a lower substrate in order to produce cavities, not molding a sidewall onto

² The Examiner relies on Mahulikar solely for the disclosure of vent holes in lids of hollow packages and Song solely for the disclosure of forming an adhesive layer through screen printing. (Ans. 4 and 5).

a substrate as presently claimed. (Br. 4 and 6). Appellant argues that Miyawaki is completely silent as to use of a molding process to produce the cavities on the substrate as presently claimed. (Br. 5-6).

ISSUE

The issue is: Has Appellant shown reversible error in the Examiner's finding that Miyawaki discloses or suggests forming cavities in a hollow package by molding sidewalls onto a substrate?

FINDINGS OF FACT

The record supports the following Findings of Fact (FF) by a preponderance of the evidence.

1. Appellant's Specification states:

In process step 704, the carrier 111 is injection-molded to define a plurality of cavities 300 with a grid of sidewalls 302. In one embodiment, the material used to form sidewalls 300 is the same compound used to form lid 104. This molding process fills the voids 212 in the substrate 202 with the compound to attach the walls 300 to the substrate 202. In step 706, the molded carrier 200 is then cured to form an array 304 of cavities 300. Each cavity 300 is defined by sidewalls 302, ground plane 208, struts 210, bonding pads 206 and substrate 202.
(Spec. [0022]).

2. Miyawaki states:

[T]he base substrate **1** is formed by bonding together a lower first substrate **1A** and an upper second substrate **1B**...Through holes or penetrating holes are formed in the second (upper) substrate **1B** in order to produce hollow cavities. The first and

second substrates **1A** and **1B** are stacked into the single base substrate **1**, thereby constituting a substrate having a plurality of cavities **4**.

(Col. 2, l. 66 – col. 3, l. 12, Figs. 2A-2C).

3. Miyawaki does not teach any other method for preparing a substrate containing cavities. (*See* Miyawaki, generally).
4. Miyawaki discloses that a commonly used transfer mold package is disadvantageous due to the close contact of the packaging materials with the packaged semiconductor chip and that prior art hollow packages must be individually joined to a frame and sealed, decreasing productivity and increasing costs. (Col. 1, ll. 15-29).
5. Miyawaki discloses that the invention is “a method of manufacturing a semiconductor device encapsulated in a hollow package...ensuring the same productivity and costs achieved by the mold package.” (Col. 1, ll. 50-58).

PRINCIPLES OF LAW

It is well settled that all the claim limitations must be taught or suggested by the prior art to establish a *prima facie* case of obviousness.

In re Royka, 490 F.2d 981, 985 (CCPA 1974).

The Court in *KSR* stated,

[o]ften, it will be necessary for a court to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue. To facilitate review, this analysis should be made explicit. *See In re Kahn*, 441 F.3d 977, 988 (C.A. Fed. 2006) (“[R]ejections on obviousness grounds cannot

be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness”).

KSR Int'l Co. v. Teleflex Inc., 127 S. Ct. 1727, 1740-41 (2007).

ANALYSIS

The Examiner’s rationale is not supported by Miyawaki, nor is it sufficient to establish a *prima facie* case of obviousness as to the appealed claims. Miyawaki discloses that in order to produce cavities in the base substrate of the packaging structure, an upper substrate having through holes is stacked and bonded to a lower substrate. (FF 2). Contrary to the Examiner’s finding, Miyawaki does not teach any other method, including molding, for preparing a substrate containing cavities. (FF 3). Miyawaki also does not suggest using molding to prepare a substrate containing cavities. Miyawaki discloses that the prior art hollow packages are inferior to transfer mold packages in cost and productivity, because the prior art hollow packages must be individually joined to a frame and sealed. (FF 4). However, the structure of the prior art transfer mold package is different than Miyawaki’s hollow package. (*See* FF 4 and 5). The Examiner does not account for the differences in structure between the prior art transfer mold package and Miyawaki’s hollow package in the rejection. The Examiner’s finding that molding is a conventional process in semiconductor processing is not sufficient to show how one of ordinary skill in the art would have applied molding in constructing Miyawaki’s hollow package structure. Further, Miyawaki provides no teaching or suggestion how molding as applied to a transfer mold package could be used to modify Miyawaki’s

process for making hollow packages. Therefore, the Examiner has not provided a sufficient reason why one of ordinary skill in the art would have applied molding to Miyawaki's process. Thus, we agree with Appellant that Miyawaki does not teach or suggest a process where the sidewalls are molded onto a substrate to form a plurality of cavities as presently claimed. (*See* Br. 4-6).

CONCLUSION

Appellant has shown reversible error in the Examiner's finding that Miyawaki discloses or suggests forming cavities in a hollow package structure by molding sidewalls onto a substrate.

ORDER

We reverse the Examiner's decision rejecting claims 1-7 and 9-11 under 35 U.S.C. § 103(a) as being unpatentable over Miyawaki in view of Mahulikar and claim 8 as being unpatentable over Miyawaki in view of Mahulikar and further in view of Song.

REVERSED

PL initial:
sld

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RAYMOND R. MOSER, JR., ESQ.
MOSER IP LAW GROUP
1030 BROAD STREET
2ND
SHREWSBURY, NJ 07702